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Beyond the gardens: notes on nomenclature, distribution and conservation of *Philodendron melinonii* Brongn. ex Regel, an emblematic Amazonian aroid

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ABSTRACT

Philodendron melinonii is an Amazonian species common in botanical gardens and urban landscaping, however its taxonomy, natural distribution and conservation are barely addressed in the literature. This work presents the nomenclatural history of the species with lectotype designation, a typographical correction and comments on its biogeographic distribution and conservation.

Keywords: typification; biogeographic provinces; collection effort; Araceae; Amazonia.

Além dos jardins: notas de nomenclatura, distribuição e conservação de *Philodendron melinonii* Brongn. ex Regel, uma Araceae amazônica emblemática

RESUMO

Philodendron melinonii é uma espécie amazônica comum nos jardins botânicos e paisagismo urbano, porém aspectos de sua taxonomia, distribuição natural e conservação são escassos na literatura. Este trabalho apresenta o histórico nomenclatural da espécie, com designação de lectótipo, uma correção tipográfica e comentários sobre a distribuição biogeográfica e conservação.

Palavras-chave: tipificação, províncias biogeográficas, esforço de coleta, Araceae, Amazônia.

Introduction

Philodendron melinonii Brogn. ex Regel is an epiphytic or hemiepiphytic species that stands out for its size and beautiful leaves among Araceae from Amazonian forests, where it is endemic and sometimes considered a dominant epiphyte (BFG, 2015; CROAT; LAMBERT, 1986). In the protologue, Regel (1874) noted the ornamental potential of the species and commented about its successful cultivation in European botanical gardens. Nowadays, it is a species widely used, both indoors and outdoors, in urban landscaping. Its easy cultivation and abundance within its range (CALAZANS, obs. pess., CROAT; LAMBERT, 1986) were probably decisive factors that resulted in a series works about the floral morphology and reproductive biology of the species (BARABÉ; LACROIX, 2000; GIBERNAU et al., 2000; MALDONADO et al., 2015; SEYMOUR; GIBERNAU, 2008).

Despite these refined works, some basic aspects relating to the name and the distribution of the species have not been adequately addressed. The present work provides the typification of *P. melinonii*, a typographical correction, the global conservation status, and comments about the distribution and ecology of the species, especially possible gaps in its distribution that could contribute to future collection efforts.

Methodology

For nomenclatural questions, the *obra princeps* (REGEL, 1874), subsequent monographs of Araceae that included the species (ENGLER, 1879, 1899; KRAUSE, 1913), and photographs of herbarium material from B, CAY, K, LE and P (abbreviations according THIERS, continuously updated), Herbário Virtual Reflora (REFLORA, 2016) and JSTOR (JSTOR, 2016) were consulted.

To delineate the geographic distribution of *P. melinonii*, occurrence records of its native distribution were used from the Jardim Botânico do Rio de Janeiro herbarium (RB - JBRJ, 2015), the herbaria included on the SpeciesLink network (2016), the Portal da Biodiversidade (2015) and GBIF (GBIF.org, 2015). Coordinates were taken from original labels or inferred using the tools geoLoc (SPECIESLINK, 2016) and GEOLocate 3.22 (RIOS; BART, 2010) when this data was not available.

A distribution map was built using the software ArcView 9.2 (ESRI, 2006). The distribution points were superimposed on a layer of the biogeographic provinces of the neotropical Amazonian subregion, as proposed by Morrone (2001).

Typification

Philodendron melinonii Brongn. ex Regel, Gartenflora 23: 67, t. 789. 1874.

Lectotype (designated here): - [illustration] Plant from Tropical America, probably French Guiana, original plate "Tafel 789 a,b,c" published in Regel, Gartenflora 23: t. 789. 1874. Fig. 1.

Epitype (designated here): French Guiana, Nouragues Field Station, near Crique Cascade (4º 05.289' N, 52º 40.774' W), 18 Feb 2002, S.A. MORI ET AL. 25404 (NY).

In the protologue, Regel noted that the species was received at the Saint Petersburg Botanical Garden as a native of tropical America, but there was no citation of a collector or specific locality. The material was similar to specimens from Cayenne, French Guiana, received at the botanical garden in Warsaw. The author did not cite any herbarium material in the work, but did provide an illustration of the plant showing a detail of the habit and the inflorescence with and without the spathe. In the Saint Petersburg herbarium (LE), where Regel worked (STAFLEU and COWAN, 1983), we found material determined as *Philodendron melinonii* by the author, which only says it was cultivated ("hort.") and only comprises inflorescences. In the same herbarium, there is another specimen with a single leaf named *Philodendron melinonii*, however, the specimen cannot be surely connected to the former, and there is no way to know if it was determined by Regel.

Thus, although there is evidence that one of the specimens at LE was examined by Regel, it is not known if the species description was based on that material, especially because it is not known if the leaf is part of the collection named by him. In *Philodendron*, both leaves and inflorescences are extremely important to determine the species identity correctly. Therefore, these specimens are not recognized as syntypes in this work.

In the following years, Engler (1879, 1899) published two monographs that cite *P. melinonii*. In the first, material from French Guiana that was cultivated in Berlin is mentioned, but the collector and locality are not cited. In the second, a collection by Mélinon with no number is cited that is also from French Guiana, as well as the collection "A. Engler: Araceae Nº 78," previously determined as *Philodendron fragrantissimum*; however, no herbarium is cited for these collections. Subsequently, Krause (1913) treated *P. melinonii* in a revision, citing the same material: "A. Engler Nº 78," with no indication of an herbarium, and

"Mélinon," from French Guiana, deposited at the Paris herbarium (P) and cultivated in Berlin. Although these collections are not mentioned in the protologue, we searched for them to try to find a possible overlooked type material. The Mélinon collection supposedly at P was not found, but the "A. Engler Nº 78" collection was found in three sterile parts at P. Two parts have illustrations of the inflorescence and indicate the plant is from Guyana and cultivated in Berlin; the third part is a Glaziou collection and only says it is from "Brésil," which was typed and probably a pre-made label that does not reflect the correct collection locality.

The main herbaria that have Regel, Brongniart and Mélinon collections were searched, as well as collections from French Guiana and Guyana, but no specimens that could be associated with the original description were found. Based on this, the only material clearly related to the protologue is the original illustration, which is here designated as the lectotype based on ICN requirements (MCNEIL et al., 2012 - Article 40.4).

An epitype is also designated following ICN recommendations (MCNEIL et al., 2012 - Article 9.8), because the lectotype is an illustration that, although detailed, does not provide actual flowers that can be studied. A fertile collection from French Guiana was chosen because it is probably the type locality, based on the information found during this study.

In the original publication, the species is spelled the first time as "*Philodendron melioninii,*" followed by the morphological description. This was clearly a typographical error, seeing that the epithet is in homage to Eugène M. Mélinon, one of the greatest collectors in French Guiana and a correspondent of the National Museum of Natural History in Paris (HOFF 2000); therefore the correct spelling is "*melinonii*." Moreover, in the work the author correctly cites the name as "*Ph. melinonii*" more than once, which leaves no doubt about the question. This correction, although small, is important because online databases (e.g., GBIF, Herbário Virtual Reflora, JSTOR, SpeciesLink) are normally standardized and follow the official spelling of IPNI (2016). In cases like this, multiple database searches need to be made to cover orthographic variants found and this usually results in finding conflicts among data systems.

Figure 1. Original plate of *Philodendron melinonii* Brongn. ex Regel chosen as lectotype. Image from the Biodiversity Heritage Library. / **Figura 1.** Prancha original de *Philodendron melinonii* Brongn. ex. Regel escolhida como lectótipo. Imagem da Biodiversity Heritage Library

Distribution and Conservation

Philodendron melinonii occurs in Amazonian forests of Venezuela, Guyana, Surinam, French Guiana and Brazil (Fig. 2). Its known distribution range is from the coast of the Guianas, from the Orinoco delta in Delta Amacuro, Venezuela, to the region of Baía de Marajó, in Belém, Brazil, and stretches to the interior until southern Venezuela, in the region of Alto Orinoco, and northern Brazil, in the region of Manaus. According to Morrone's proposal (2001), its distribution covers the Guyana, humid Guyana, Roraima, Amapá, Várzea and Pará biogeographic provinces, in regions that are characterized by humid forests, in inundated areas or marshes, interspersed with Amazonian savanna. Most of the records for this species are from lowland forests, in várzea and humid forests (Fig. 3).

The analysis using GeoCAT showed an EOO of 1,571,253.833 km^2 and an AOO of only 252 km^2, which indicates the species is endangered (EN) based on IUCN (2010) criteria. Although there are no known direct threats for *P. melinonii*, its habitat is suffering from diverse anthropogenic impacts that put the known populations at risk. Among these, activities related to livestock, such as deforestation followed by substituting native vegetation for pastures, as well as fires, are frequent in areas of várzea in the Amazonian region (MORRONE, 2001).

The AOO found for the species conflicts with what is in the literature (CROAT and LAMBERT, 1986) about its abundance and representativeness in Amazonia. This clearly reflects the low collection effort for the species, as seen by the scattered distribution of the collections in the map. Throughout its distribution, only French Guiana is well sampled (ca. 48% of the records found), which is the result of the large floristic inventory conducted in this overseas department (The Flora of the Guianas Project - OLIVEIRA, 2016) that confirmed the taxon is abundant in the region. Moreover, based on this, we can assume that similar projects in neighboring countries would contribute significantly to understanding the distribution of the species, especially in Brazil where there are the most significant gaps.

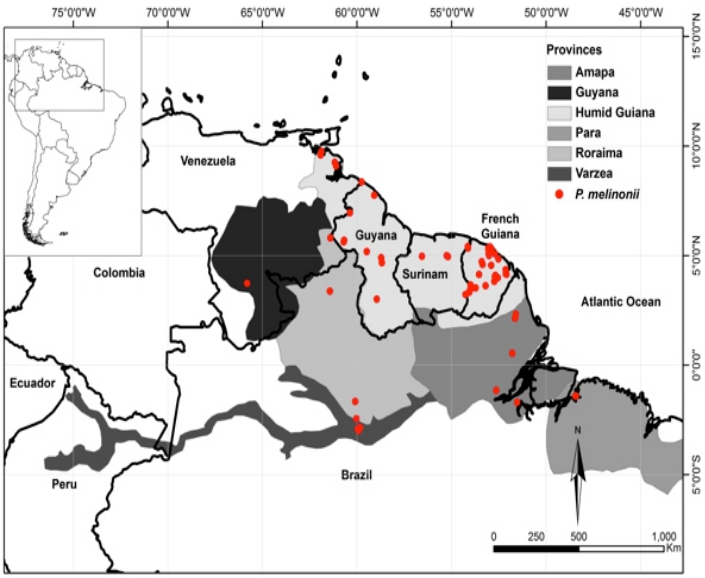

Figure 2. Distribution map of *Philodendron melinonii* Brongn. ex Regel over the biogeographic provinces of Amazonian subregion (following MORRONE, 2001). / **Figura 2.** Mapa de distribuição de *Philodendron melinonii* Brongn. ex Regel nas províncias biogeográficas da sub-região amazônica (seguindo MORRONE, 2001).

Figure 3. Habit and habitat of *Philodendron melinonii* Brongn. ex Regel. A-B: adult plant hemiepiphytes; C: adult plant rupiculous; D: young plant epiphyte; E: humid forest in Presidente Figueiredo, Amazonas, Brazil; F: humid forest (igarapé) in Santa Isabel do Pará, Pará, Brazil. Photographs A by S. Jorge; B, D-F by L.S.B. Calazans; C by A.C. Mezzonato. / **Figura 3.** Hábito e habitat de *Philodendron melinonii* Brongn. ex Regel. A-B: plantas adultas hemiepífitas; C: planta adulta rupícola; D: planta jovem epífitas; E: floresta húmida em Presidente Figueiredo, Amazonas, Brasil; F: floresta úmida (igarapé) em Santa Isabel do Pará, Pará, Brasil. Fotografias A por S. Jorge; B, D-F por L.S.B. Calazans; C por A.C. Mezzonato.

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